Travel Time Studies with GPS Receivers

GPS Receivers

- Magellen and Garmin can be used for studies
- Other manufactures
- Widely available

Travel Time Studies with GPS Receivers

What is GPS?

- Global Positioning System
- Navigational system of 24 satellites
- Installed by U.S. Department of Defense and originally intended for military use but now available for civilian use

Travel Time Studies with GPS Receivers

Satellites

- 21 are in service at all times
- Life expectancy of approximately 10 years
- 3 are on standby for replacement
- New satellites are constantly being built and launched
- Solar powered with battery backup
- Transmitter power - 50 watts or less

Travel Time Studies with GPS Receivers

Satellites

- Orbiting so a GPS receiver can always receive signal from at least four at any time
- Have small booster rockets to correct path

Travel Time Studies with GPS Receivers

Signal

- Travels by line of sight
- Passes through clouds, glass and plastic but not solid objects such as buildings and mountains

Travel Time Studies with GPS Receivers

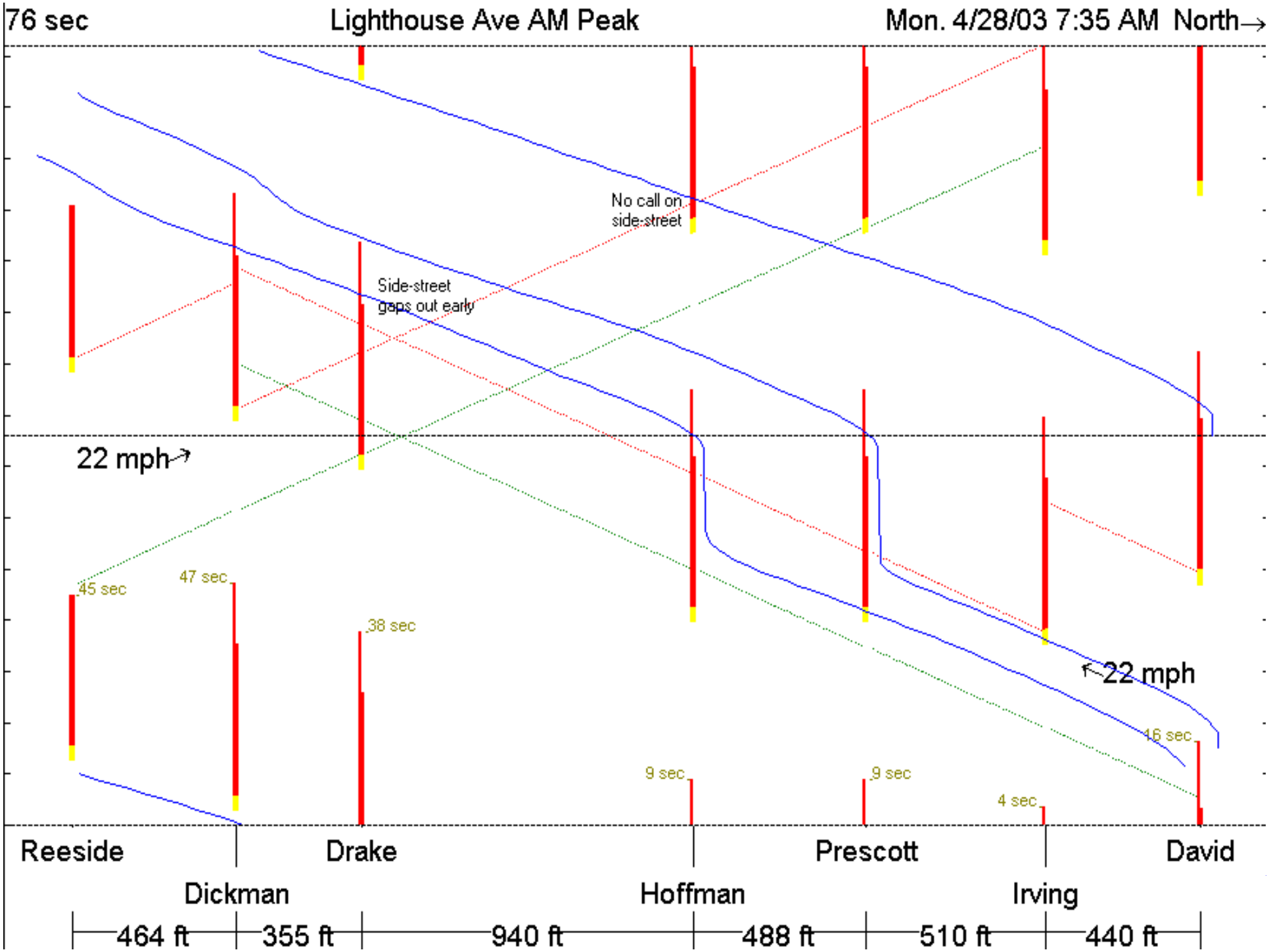
Connect GPS Receiver to a laptop with TS/PP-Draft to track position and speed:

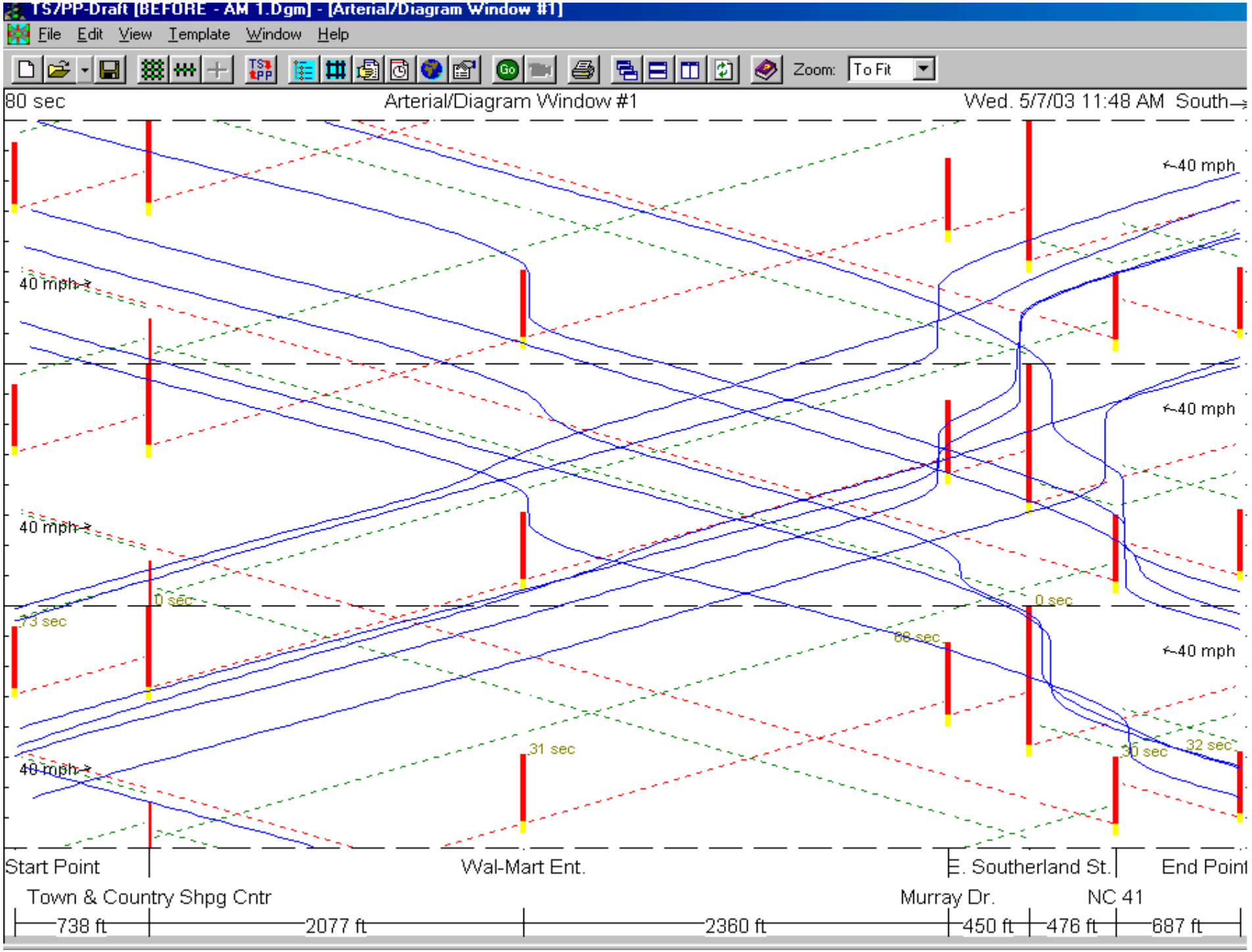
- Calculate the distance between intersections,
- Lay out the Network View with high accuracy,
- Display your current location in time and space on the diagram window
- Predict whether you will arrive at the next signal during the green time,
- Record Trip Logs of travel along the artery.

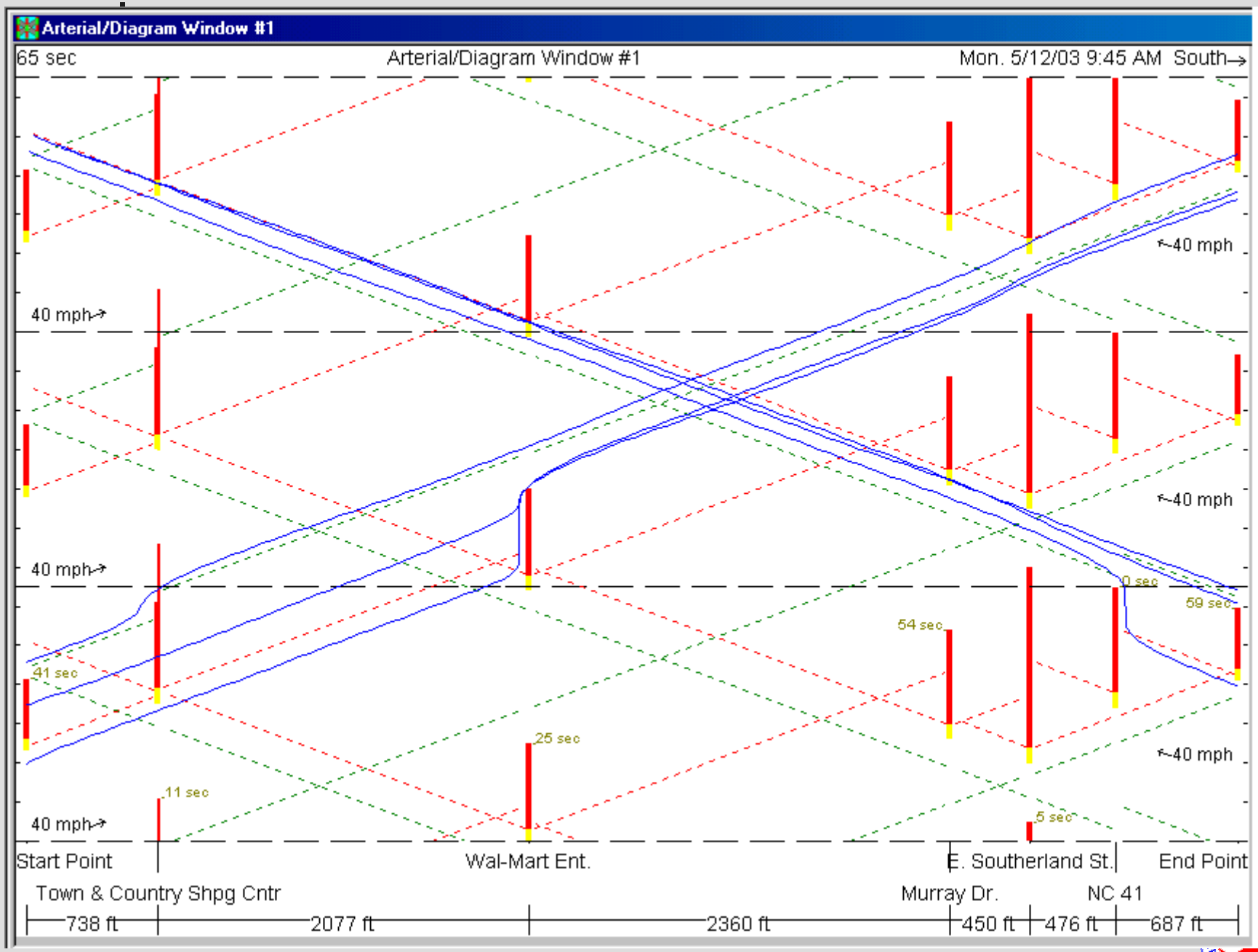
Travel Time Studies with GPS Receivers

Trip Logs can be:

- Plotted as trajectories on the diagram windows, graphically showing where delay occurs, which signals you're stopped at, and where you enter or leave the green bands
- Used to prepare Travel Time and Delay Reports,
- Used to measure the actual travel distance between intersections,
- Used to calculate the actual average speed between intersections.


76 sec
Lighthouse Ave AM Peak
Mon. 4/28/03 7:35 AM North→
No call on side-street
Side-street gaps out early
22 mph→
←22 mph
45 sec
47 sec
38 sec
9 sec
9 sec
4 sec
16 sec
Reeside
Dickman
Drake
Hoffman
Prescott
Irving
David
464 ft
355 ft
940 ft
488 ft
510 ft
440 ft


TS/PP-Draft [BEFORE - AM 1.Dgm] - [Arterial/Diagram Window #1]
File Edit View Template Window Help
Zoom: To Fit
80 sec
Arterial/Diagram Window #1
Wed. 5/7/03 11:48 AM South
←40 mph
40 mph→
←40 mph
40 mph→
0 sec
0 sec
73 sec
68 sec
←40 mph
31 sec
30 sec
32 sec
40 mph→
Start Point
Wal-Mart Ent.
E. Southerland St.
End Point
Town & Country Shpg Cntr
Murray Dr.
NC 41
738 ft
2077 ft
2360 ft
450 ft
476 ft
687 ft


Arterial/Diagram Window #1
65 sec
Arterial/Diagram Window #1
Mon. 5/12/03 9:45 AM South
40 mph
40 mph
40 mph
40 mph
40 mph
41 sec
11 sec
25 sec
54 sec
0 sec
59 sec
5 sec
Start Point
Wal-Mart Ent.
E. Southerland St.
End Point
Town & Country Shpg Cntr
Murray Dr.
NC 41
738 ft
2077 ft
2360 ft
450 ft
476 ft
687 ft

NB

Legend:

ET	Elapsed Time since beginning of Run until Crossing Time (seconds)
TT	Travel Time from previous Node (seconds)
Delay	Delay in Travel Time from previous Node based on user-specified average Speed (seconds)
CD	Cumulative Delay since beginning of Run (seconds)
Stops	Number of Stops in Travel from previous Node
CStops	Cumulative Number of Stops in Run

Before

AVERAGES

Node	ET	TT	Delay	CD	Stops	CStops
NC 41	28	28	16	16	1	1
E. Southerland St.	57	29	21	37	1	2
Murray Dr.	71	14	7	44	0	2
Wal-Mart Ent.	120	49	9	53	0	2
Town & Country Shpg Cntr	156	36	1	53	0	2

After

AVERAGES

Node	ET	TT	Delay	CD	Stops	CStops
NC 41	18	18	6	6	0	0
E. Southerland St.	27	10	2	8	0	0
Murray Dr.	36	8	1	9	0	0
Wal-Mart Ent.	76	40	0	9	0	0
Town & Country Shpg Cntr	112	35	0	9	0	0

SB

Legend:

ET	Elapsed Time since beginning of Run until Crossing Time (seconds)
TT	Travel Time from previous Node (seconds)
Delay	Delay in Travel Time from previous Node based on user-specified average Speed (seconds)
CD	Cumulative Delay since beginning of Run (seconds)
Stops	Number of Stops in Travel from previous Node
CStops	Cumulative Number of Stops in Run

Before

AVERAGES

Node	ET	TT	Delay	CD	StopD	CStopD
Town & Country Shpg Cntr	13	13	0	0	0	0
Wal-Mart Ent.	49	36	0	1	0	0
Murray Dr.	104	56	15	16	1	1
E. Southerland St.	127	23	15	31	1	2
NC 41	138	11	3	34	0	2

After

AVERAGES

Node	ET	TT	Delay	CD	Stops	CStops
Town & Country Shpg Cntr	15	15	2	2	0	0
Wal-Mart Ent.	61	46	10	13	1	1
Murray Dr.	104	43	3	16	0	1
E. Southerland St.	114	10	2	18	0	1
NC 41	123	9	1	19	0	1